MXC-2012

Fanless Expandable Embedded Computer

User's Manual



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Part No: 50-1Z118-1000

Recycled Paper

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Revision History

Revision	Release Date	Description of Change(s)
2.00	Apr. 30, 2012	Initial release

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

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Additional information, aids, and tips that help users perform tasks.



Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

1.1 Overview



ADLINK's Matrix MXC-2012 is an application support system based on the Intel® Atom™ N270 1.6GHz processor, delivering ample performance with minimal power consumption. 2PCI and 1PCIex4 expansion slots enable integration of off-the-shelf PCI/ PCIe cards for configurable application platforms. Generic I/O interfaces, such as Gigabit Ethernet, COM, USB are also provided for device connection, and VGA+S-Video dual graphic outputs provide connection to larger displays such as LCD TV.

The MXC-2012 is functional within a -20 to 70 °C temperature range with standard 5Grms vibration tolerance, presenting a rugged, fanless, cable-free design with isolation DC input, compliant

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with EN/IEC 60945 & IACS E10, suiting it perfectly to bridge or machinery control systems in seaborne applications. Additionally, compact size and low power consumption combine with a user-friendly mechanical design for ease of installation and system reliability under the most challenging onboard conditions.

1.2 Features

- Intel® Atom™ N270 1.6 GHz processor + 945GSE chipset
- Configurable, providing both PCI and PCIe slot options
- Rugged, -20°C to 70°C fanless operation
- Built-in DC to DC isolated power input module
- Dual 1000/100/10 Mbps Ethernet ports
- Two RS-232 ports and two RS-232/422/485 ports
- Two CF sockets for HDD replacement and hot-swappable data storage
- VGA + S-Video independent dual display outputs

1.3 Specifications

System Core	
Processor	Intel® Atom™ N270 1.6 GHz CPU
Chipset	Intel® 945GSE Graphic Memory Control Hub
	Intel® I/O Controller Hub 7 Mobile (ICH7-M)
Video	Analog CRT, supports QXGA (2048 x 1536) resolution
Memory	2 GB DDR2 533 MHz SODIMM module
I/O Interface	
Expansion Slots	2PCI + 1PCIex4 slots
Ethernet	2x GbE Ports (Realtek® 8111C)
Serial Port	2x RS-232/422/485 (jumper selectable, COM1 & COM2) 2x RS-232 (COM3 & COM4)
USB	4x USB 2.0 Ports

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Audio	1x Mic-in and 1x Speaker-out
KB/MS	1x PS/2 Keyboard and 1x PS/2 Mouse
Power Supply	
DC Input	18-36V isolation DC input 3P Plug and Play Connector with Latch (GND, V-, V+)
AC Input	Optional 60W external AC-DC adapter for AC input
Storage Devices	
SATA HDD	Onboard SATA Port for 2.5" HDD/SSD Installation
CompactFlash	2x Type II CF Sockets, Supporting PIO and DMA Modes CF1 (internal) for HDD Replacement CF2 (external) Supports Hot-swapping
Mechanical	
Dimension	150 (W) x 219 (D) x183 (H) mm (5.9 x 8.62 x 7.2 in)
Weight	3.1 kg (6.83 lb)
Mounting	Wall-mount kit
Environmental	
Operating Temperature	-20°C to 70°C(w/CF or SSD) or 0°C to 50°C (w/HDD)
Storage Temperature	-40°C to 85°C (w/CF or SSD) or -20°C to 70°C (w/HDD)
Humidity	~95% @ 40°C (non-condensing)
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/CF or SSD) Operating, 0.7 Grms, 5-500 Hz, 3 Axes (w/HDD)
Shock	Operating, 50 Grms, Half-sine 11 ms duration (w/CF or SSD)

Table 1-1: MXC-2012 Specifications

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1.4 Schematics

NOTE:

Please note that all dimensions shown are in mm.

1.4.1 Front View

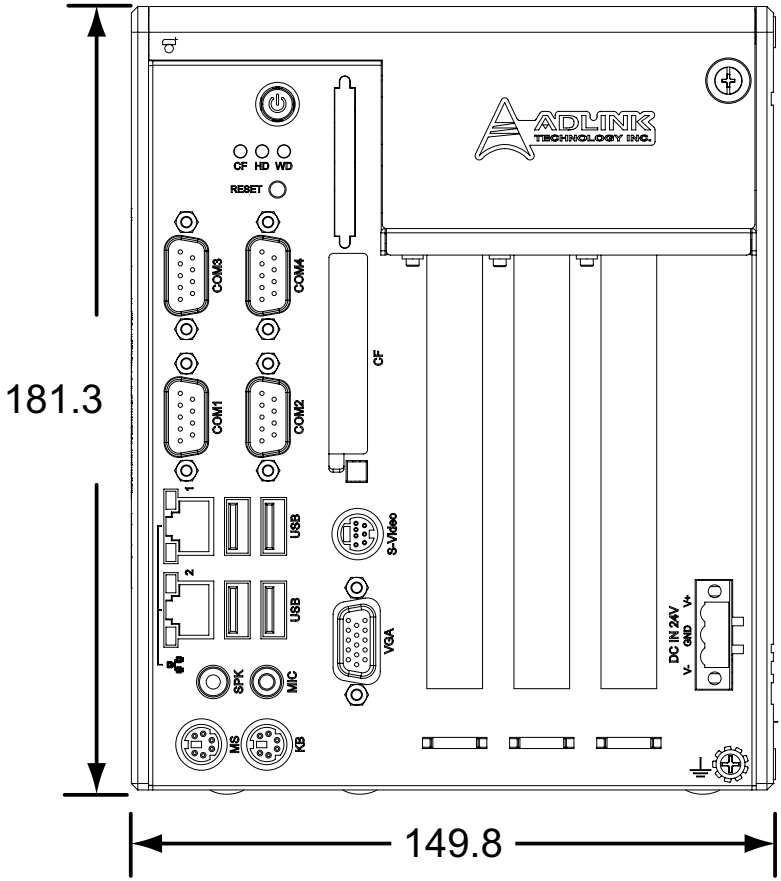


Figure 1-1: MXC-2012 Front View

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1.4.2 Top View

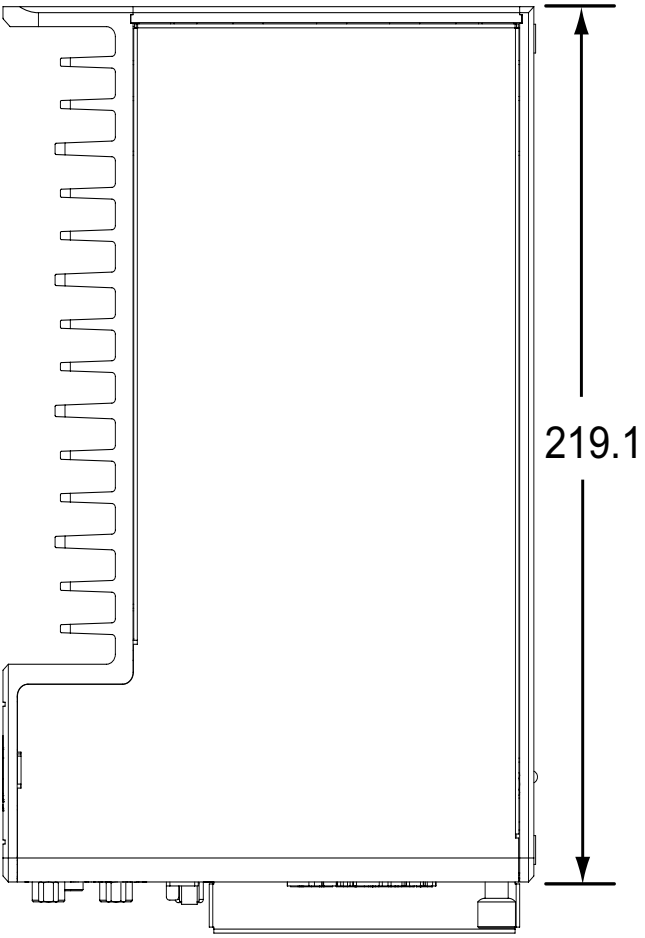


Figure 1-2: MXC-2012 Top View

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1.4.3 Underside View

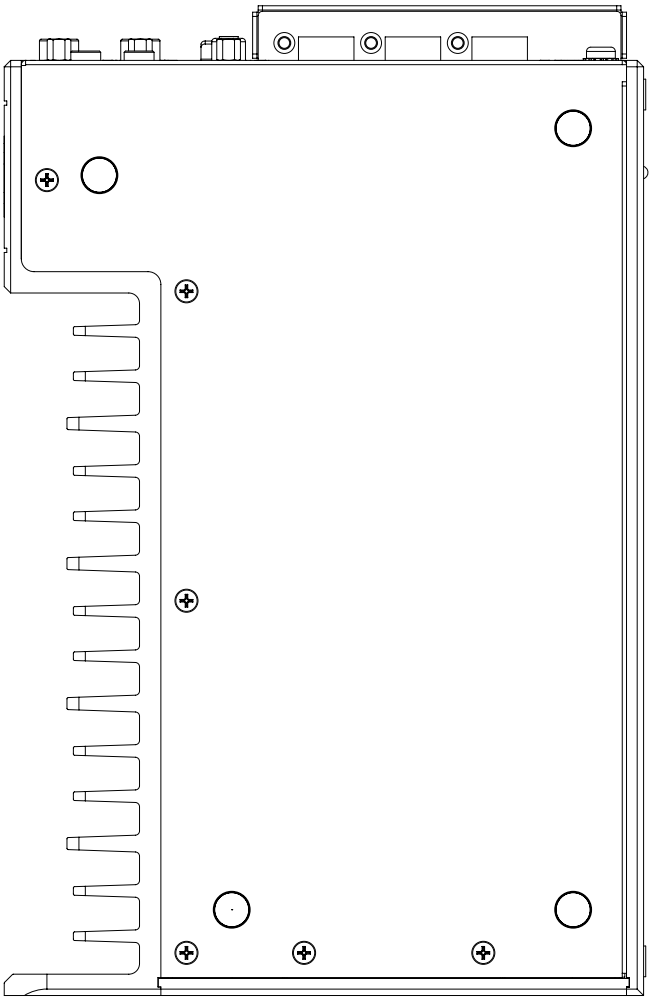


Figure 1-3: MXC-2012 Underside View

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1.4.4 Right Side View

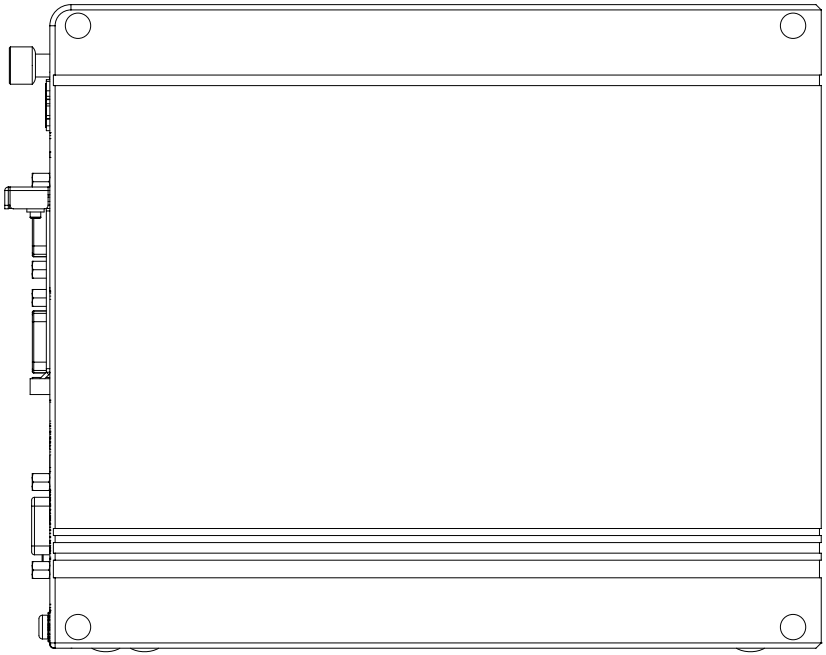


Figure 1-4: MXC-2012 Right Side View

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1.4.5 Left Side View

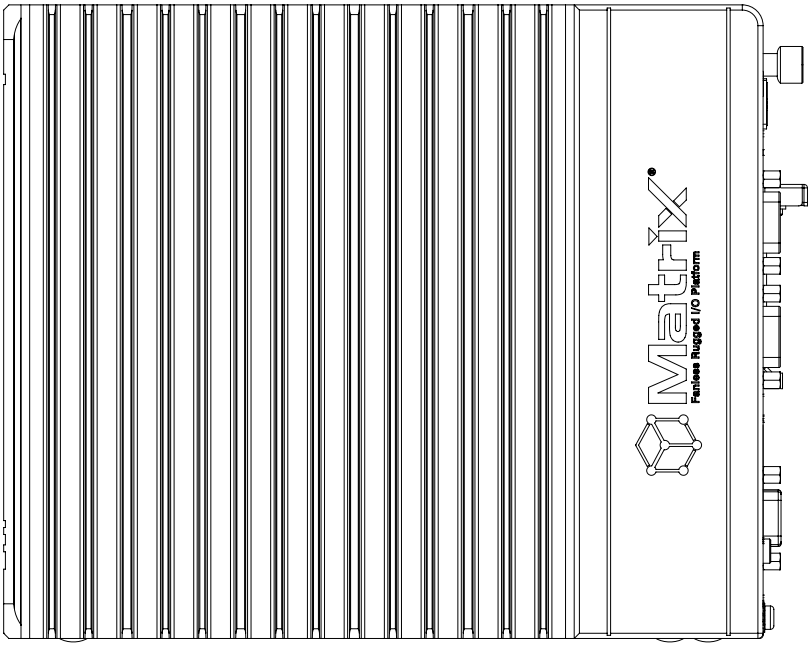
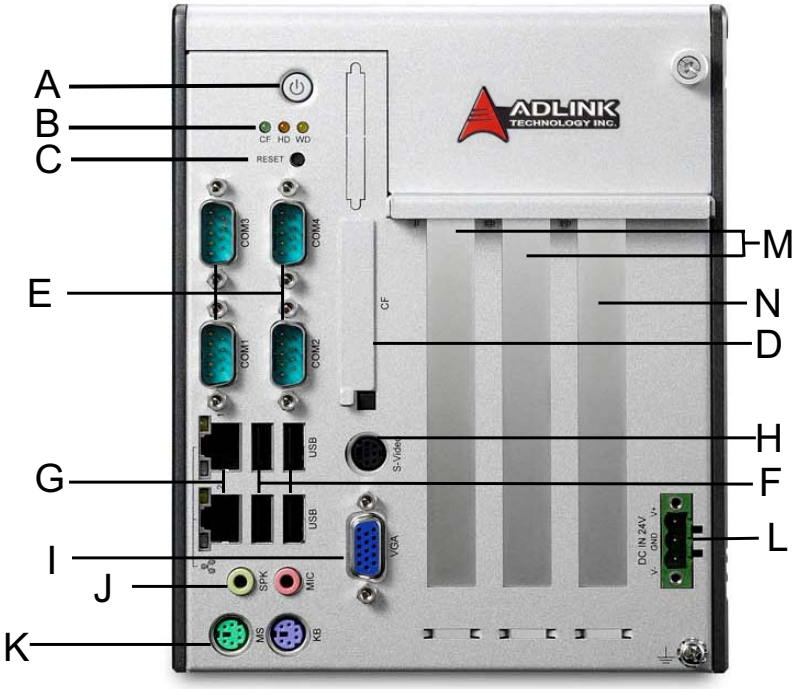


Figure 1-5: MXC-2012 Left Side View

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1.5 Front Panel Connectors and Indicators



A	Power button	H	S-video connector
B	LED indicators	I	VGA connector
C	Reset button	J	Audio jacks
D	CompactFlash socket	K	PS2 keyboard & mouse
E	COM ports (4)	L	DC power input connector
F	USB 2.0 ports (4)	M	PCI slots (2)
G	Dual Gigabit Ethernet ports (2)	N	PCIe x4 slot

Table 1-2: MXC-2012 Front Panel Legend

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1.5.1 Power Button

The power button is a non-latched push button with a blue LED indicator. The system is turned on when button is pressed, and the power LED is also illuminated. To shut down the system, you can issue shutdown command via the operating system or just press the power button. If the system halts, you can also press the button for 5 seconds to force system shutdown.

1.5.2 LED Indicators

There are three LED indicators on the front panel. The following table describes the color and function of the LED indicators.

LED indicator	Color	Description
Watchdog (WD)	Yellow	Indicates the status of watchdog timer. When the watchdog timer is started, the LED is flashing. And when the timer is expired, the LED is on.
Hard disk drive (HD)	Orange	Indicates tthe operating state of HDD. When the SATA hard drive or internal CF card is active, the LED indicator is flashing.
CompactFlash card (CF)	Green	Indicates the operating state of CF card on the front panel. The LED indicator is flashing when the CF card is active.

Table 1-3: MXC-2012 LED Function

1.5.3 Reset Button

The reset button is used to perform a hard reset of the MXC-2012. You can use a pin-like object to depress the reset button.

1.5.4 CompactFlash Socket

The MXC-2012 is equipped with a Type I CompactFlash socket which is located on the front panel. The CF interface is connected to the system chipset via USB. Due to the nature of USB interface, the CF card is hot-pluggable, but cannot be a boot device with a OS installed. You can install your operating system to the internal CF card, as described in Installing CF Cards.

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1.5.5 COM Ports

The MXC-2012 provides four COM ports in the form of D-Sub 9P connectors. COM1 and COM2 ports support RS-232/RS-422/RS-485 by jumper selection, while COM3 and COM4 ports support RS-232 function only. See “COM Port Setting Jumpers” on page 17. for instructions on setting RS-232/422/485 jumpers of COM1 and COM2 ports.

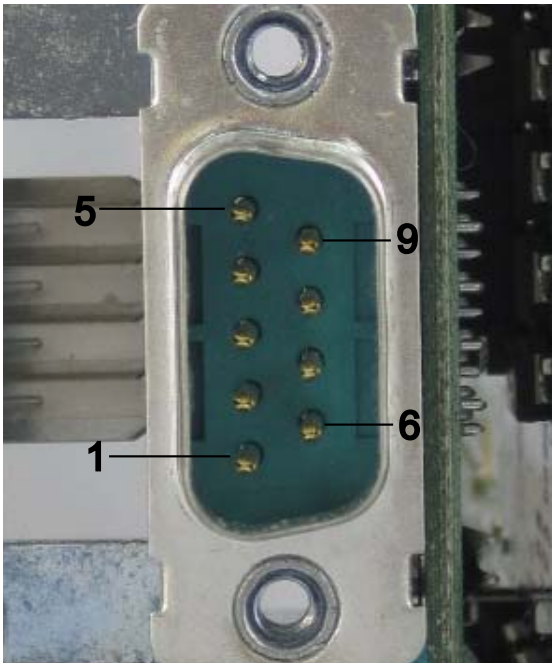


Figure 1-6: MXC-2012 COM Port Pin ID

Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD#	TXD422-	485DATA-
2	RXD#	TXD422+	485DATA+
3	TXD#	RXD422+	
4	DTR#	RXD422-	
5	GND		

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Pin	Signal Name		
	RS-232	RS-422	RS-485
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

Table 1-4: MXC-2012 COM Port Pin Assignment

1.5.6 USB 2.0 connectors

The MXC-2012 provides four USB 2.0 ports with Type A USB connectors on the front panel. All USB ports are compatible with high-speed, full-speed and low-speed USB devices. The MXC-2012 supports multiple boot devices, including USB flash drive, USB external hard drive, USB floppy, USB CD-ROM and others. The boot priority and boot device can be configured in the BIOS. Please see Chapter 4 for details.

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1.5.7 Gigabit Ethernet (RTL8111C)

The MXC-2012 has two GbE ports on the front panel, based on the Realtek 8111C Gigabit Ethernet controller, supporting:

- PCI Express® interface with 2.5 GHz signaling
- Message signaled interrupts
- TCP segmentation offload/large-send support
- 802.3x flow control-compliant
- IEEE 802.1p and 802.1q support
- 10/100/1000 IEEE 802.3-compliant
- Automatic MDI/MDIX crossover at all speeds
- ACPI 2.0 specification
- Wake-On-Link feature
- Fully integrated ASF 2.0 functionality with on-chip µc
- SMBus 2.0 master interface for ASF functionality
- Serial Peripheral Interface (SPI) for ASF firmware



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Active/Link LED

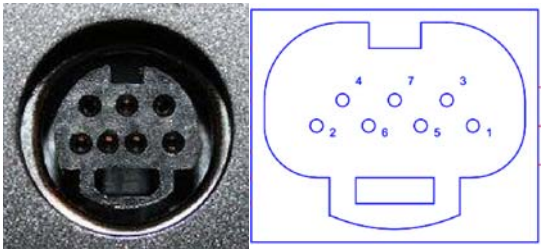
LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	ON	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and is transmitting/ receiving data.

Speed LED

LED Color	Status	Description
Green/Orange	Green	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

1.5.8 S-Video Connector

The MXC-2012 provides a 7-pin S-video connector on the front panel. The S-Video signals are available on the four matching pins (pin #1 to #4). One of the other three pins carries the Composite Video signal for non-S-Video displays. A specific "S-Video to Composite" cable is shipped with the MXC-2012 for connecting to the composite video connector of a TV.



Pin	Signal Name
1	Ground (all grounds are connected together)
2	Ground
3	S-Video Luminance Signal
4	S-Video Chrominance Signal

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Pin	Signal Name
5	Composite Video signal
6	Ground
7	--

Table 1-5: MXC-2012 S-Video Pin Functions

1.5.9 VGA connector

The D-sub 15-pin VGA connector is used to connect your MXC-2012 to a monitor. The MXC-2012 supports only analog (VGA) monitors.

1.5.10 Audio Jacks

The MXC-2012 implements Intel High Definition audio using Realtek ALC262 chip. The HD audio supports up to 24-bit, 192 Kbps high quality headphone/speaker output and microphone input. Users can access the audio jacks on the front panel of MXC-2012. The pink jack is for microphone input, and the green jack is for speaker output.

1.5.11 Keyboard & Mouse PS2 connectors

The MXC-2012 provides connectors for connecting PS2 keyboard and mouse. The green connector is for PS/2 mouse and the purple one is for PS/2 key-board.

1.5.12 DC Power Input Connector

The DC power input connector of the MXC-2012 consists of three pins: V+, V- and chassis ground from right to left respectively. V+ and V- pins are for DC power input and the chassis ground pin connects the chassis to ground for better EMC compatibility. The DC power input of MXC-2012 allows 24V DC input. The MXC-2012 is equipped with a built-in DC-DC converter, providing isolated power input protection, especially supporting a variesty of critical maritime applications.

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1.6 Internal I/O Connectors

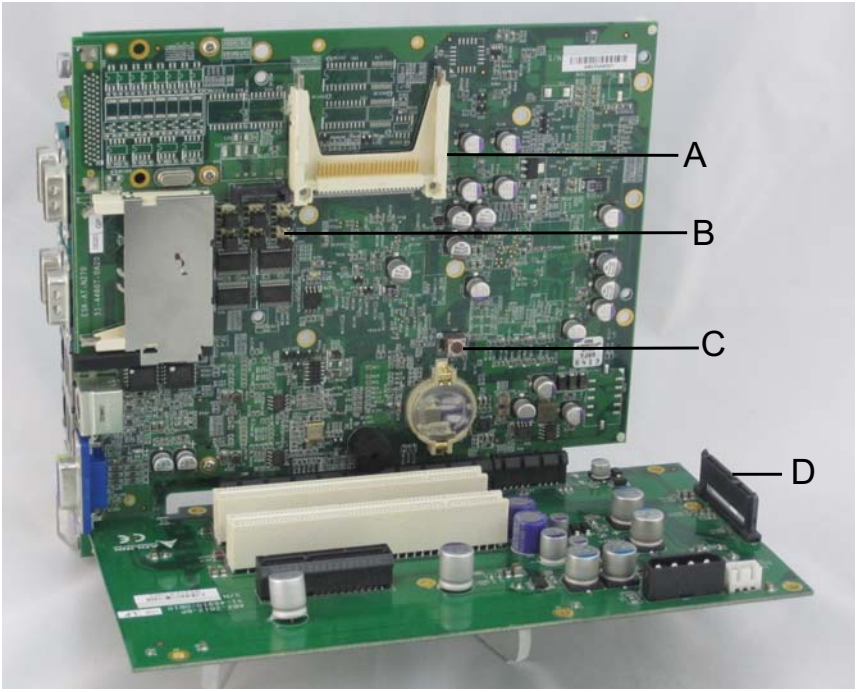


Figure 1-7: MXC-2012 Internal Board

Symbol	Function
A	CompactFlash Socket
B	COM ports setting jumpers
C	Clear CMOS button
D	SATA connector

Table 1-6: MXC-2012 Internal Board Connectors

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1.6.1 CompactFlash Socket

The internal CompactFlash socket is connected to chipset via IDE interface, and can be used as an alternative storage device for system installation. You can boot up the MXC-2012 via a CF card with OS installed. Due to the nature of IDE interface, the CF card is not hot-pluggable and must be installed before system power on. Please refer to Installing CF Cards for information regarding installing a CF card.

1.6.2 COM Port Setting Jumpers

These six jumpers (JP2/JP3/JP4/JP5/JP6/JP7) are used for configuring COM1 and COM2 ports to RS-232/422/485 mode. See “Jumper Settings for COM1 and COM2” on page 26. for information regarding setting COM1 and COM2 ports.

1.6.3 SATA Connector

The MXC-2012 provides a SATA Gen.1 port. The SATA host controller supports two modes of operation, the legacy mode using I/O space and AHCI mode using memory space. This SATA connector is designed for installing a 2.5” hard disk drive or solid state disk (SSD). The HDD or SSD must be installed into SATA connector with a specific bracket mounted on the chassis. Please refer to Installing Hard Disk Drives for information regarding installation of a 2.5” hard disk drive or SSD.

1.6.4 Clear CMOS Button

When encountering abnormal conditions preventing the MXC-2012 from booting, BIOS content stored in CMOS can be cleared and restored to the default setting. To clear CMOS, just press the button and hold on for 1~2 seconds before releasing. CMOS will restore to factory default settings.

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2 Getting Started

This chapter describes installation of system components, and other deployment procedures. Additional COM port jumper settings and MXC-2012 wall-mount installation are also discussed.

2.1 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK.

Check if the following items are included in the package.

- MXC-2012
- Accessory box including:
  - Two wall-mounting brackets
  - Two hold-down bars
  - One 3-pin pluggable terminal block for power input
  - Screws for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD



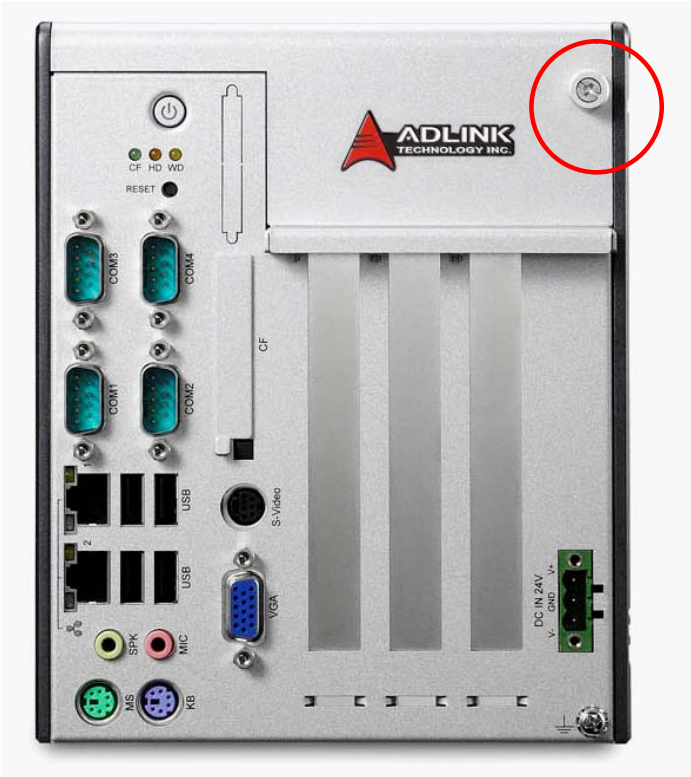
Package contents of OEM versions may vary depending on customer requests. The assigned controller and/or peripheral modules may be pre-installed and shipped with the chassis. Check with your dealer for additional information.

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2.2 Installing Hard Disk Drives

Before installing a hard disk drive, the chassis cover must first be removed, as follows.

1. Undo the thumbscrew on the front panel.

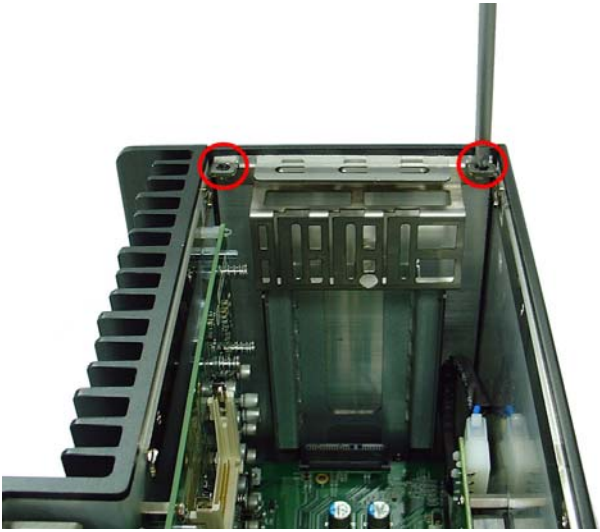


2. Withdraw the thumbscrew and remove the top cover by pulling and lifting.





3. Remove the two screws from the top of the HDD bracket



4. Invert the chassis and remove the other two screws from

the underside of the HDD bracket.



5. Lift the HDD bracket.



6. Use the included four M3 screws to fix a 2.5'' HDD or

SSD to the bracket.



7. Gently push the HDD/SSD bracket down into the SATA connector.
8. Reverse Steps 3 and 4 to fasten the 4 screws.
9. Replace the top cover and fasten the thumbscrew.

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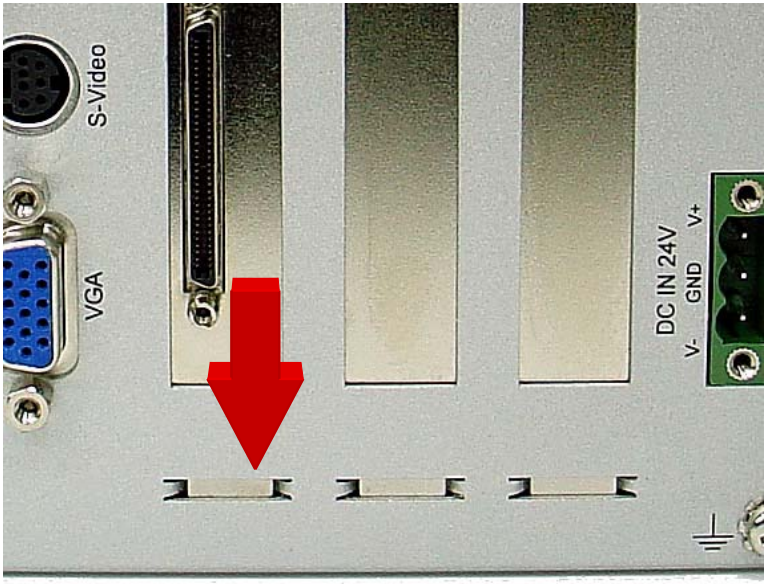
2.3 Installing PCI/PCIe cards

Once the top cover is removed:

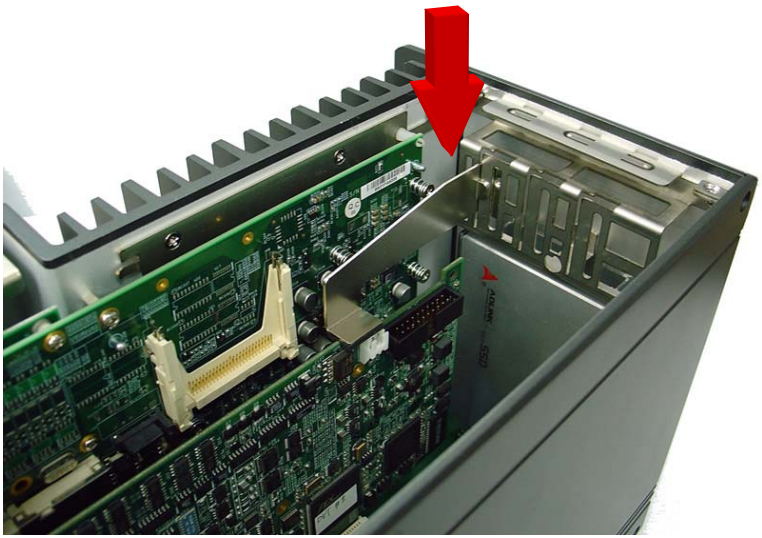
1. Insert a PCI/PCIe card into the PCI/PCIe slot, ensuring that the lower edge of the PCI/PCIe card aligns with the alignment guide.



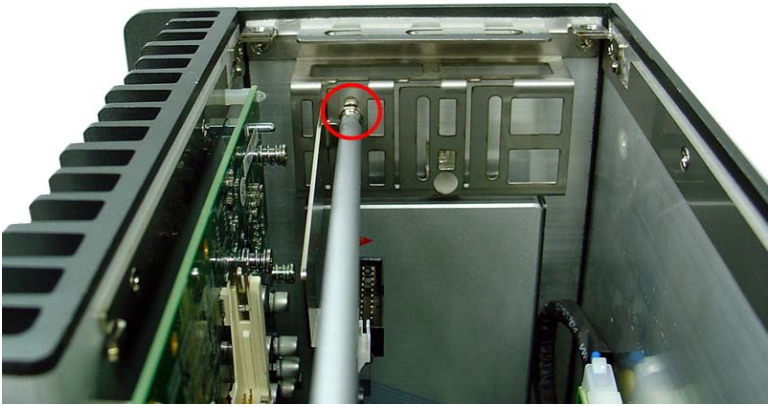
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2. Adjust the position of the included card brace to hold the card firmly.



3. Tighten the included M3 PW-head screw to fix the brace.



4. Replace the top cover and fasten the thumbscrew.

2.4 Jumper Settings for COM1 and COM2

COM1 and COM2 support RS-232, RS-422 and RS-485 connection. JP2 to JP7 set the operating mode as follows.

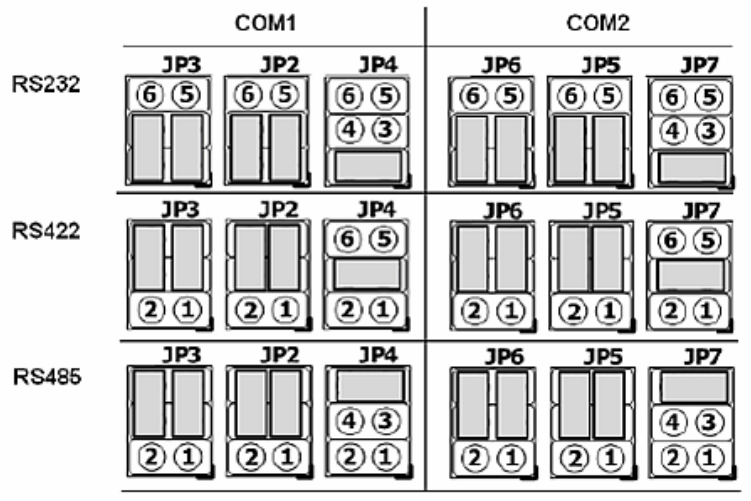


Figure 2-1: MXC-2012 COM1 & COM2 Jumper Settings

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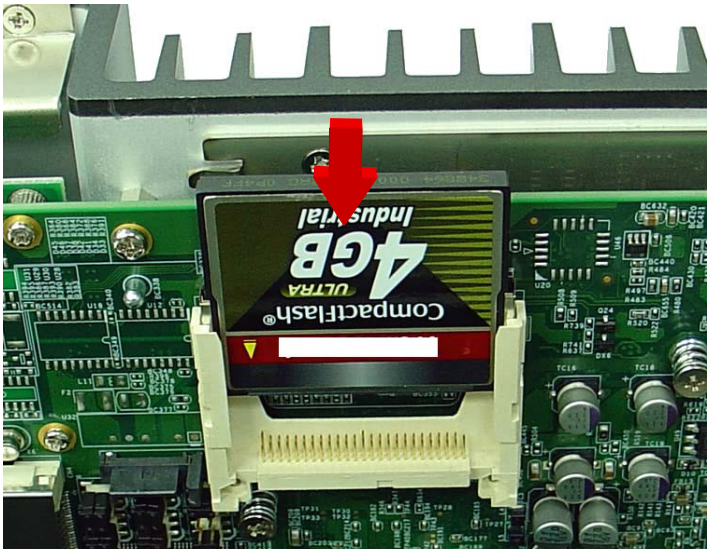
2.5 Installing CF Cards

The MXC-2012/M2G series controller provides internal and external CompactFlash sockets to accommodate a total of two CF cards. The internal installation replaces a hard disk drive.

Once the top cover is removed:

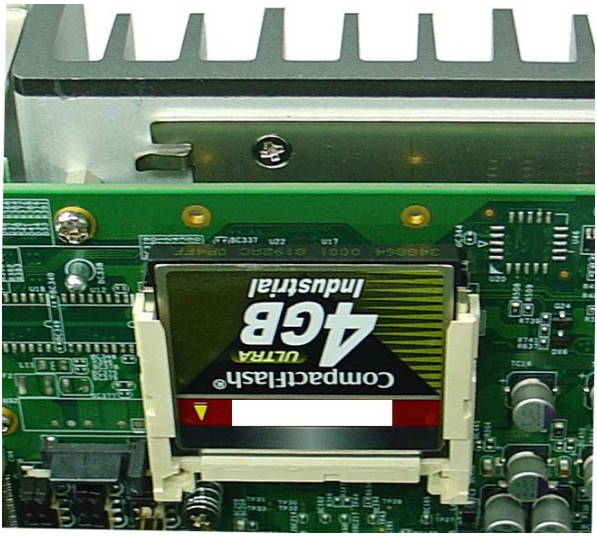
For internal installation

1. Align the CF card with the guide of the internal CF socket.

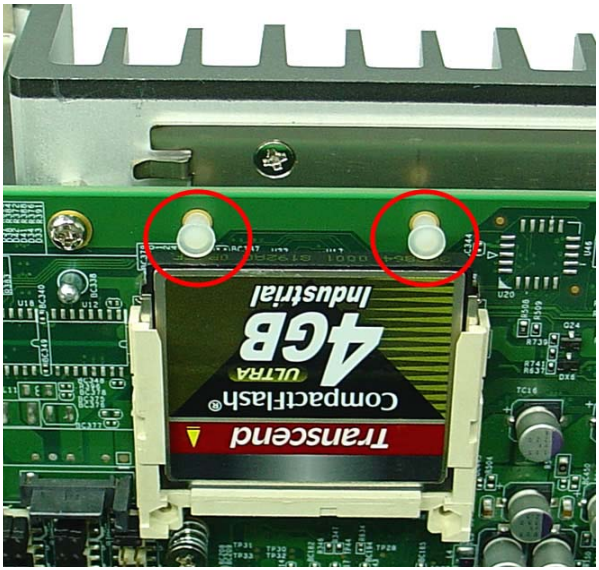


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2. Gently depress the CF card until it is firmly seated in the internal CF socket.



3. Position the two included spacer supports to prevent the CF card from dislodging.



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4. Replace the top cover and refasten the thumbscrew.

For external installation

1. Remove the external CF socket cover.



2. Align the CF card with the guide of the external CF socket.



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3. Gently insert the CF card until it is firmly seated in the external CF socket, as indicated by the extension of the eject button below the card slot, as shown.



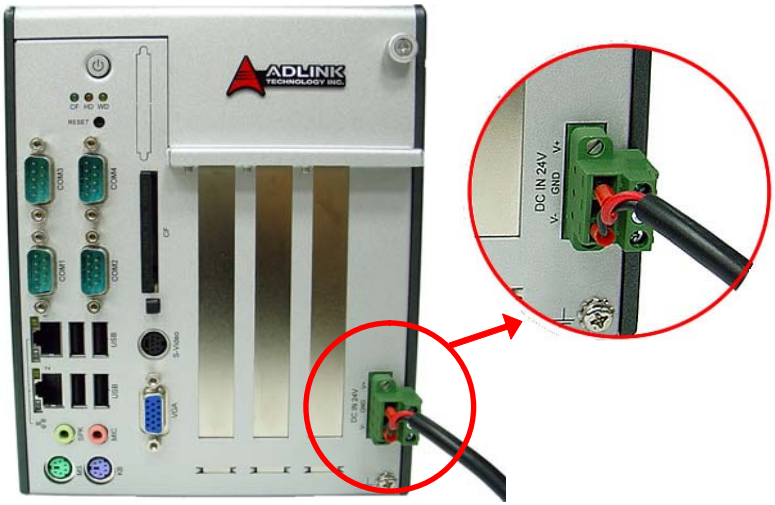
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2.6 Connecting DC power

CAUTION:

Before connecting DC power to the MXC-2012/M2G series controller, ensure that voltage and polarity are compliant with the DC input. Improper input voltage or polarity can cause system damage.

The DC power input connector of the MXC-2012/M2G series controller provides V+, V-, and chassis ground pins, for input voltage. Two screws secure the plug to connect DC power as shown.



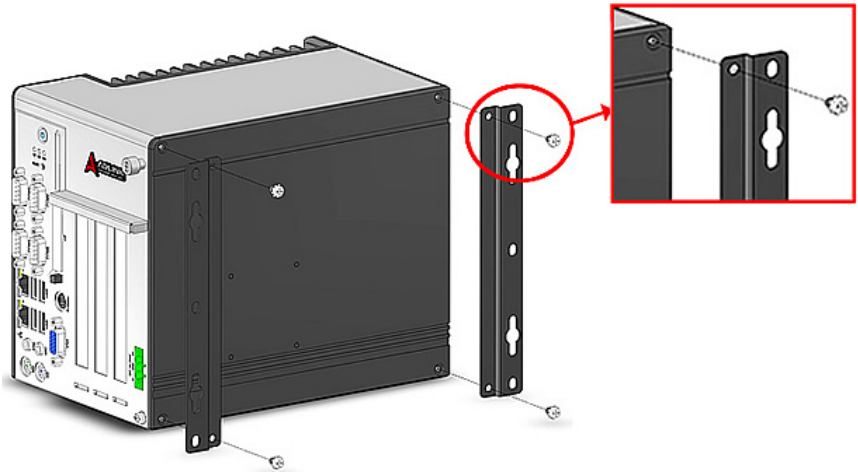
2.7 Wall-Mounting the MXC-2012

The MXC-2012/M2G series controller is shipped with wall-mount brackets and accessory screws.

1. Remove the 4 plastic pads from the corners.

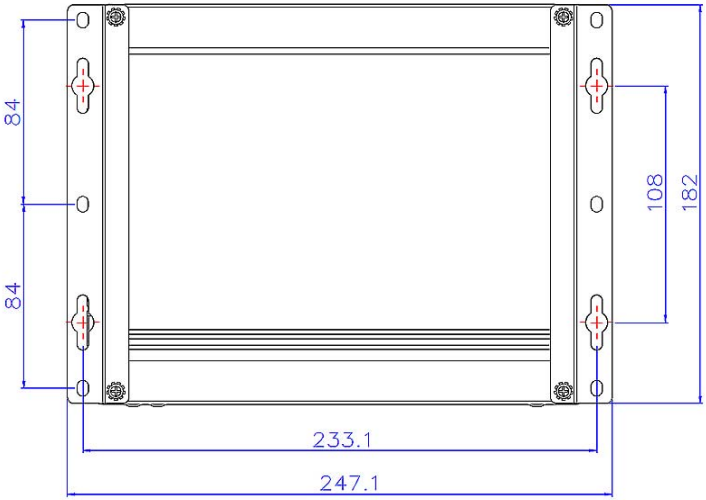


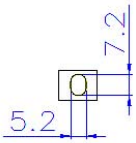
2. Use the 4 included M4 screws to fix the 2 wall-mount brackets to the chassis.

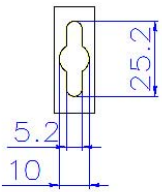


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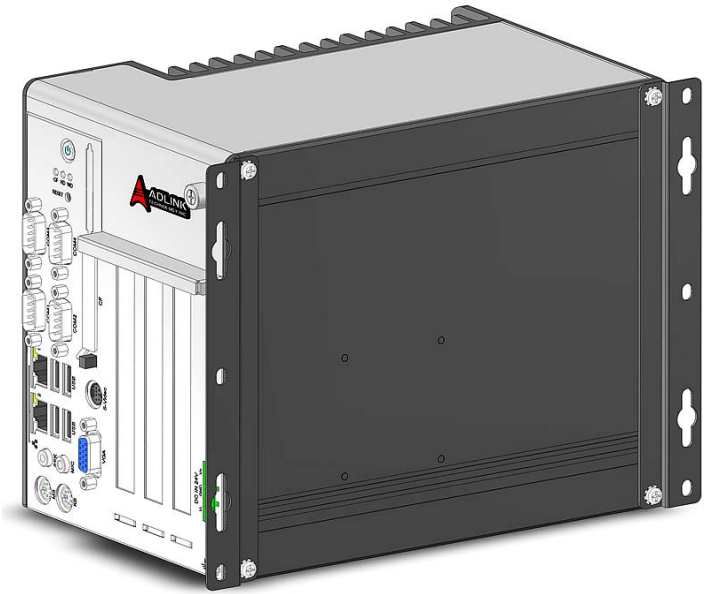
Prepare wall-mount holes in the mounting surface according to the schematics shown







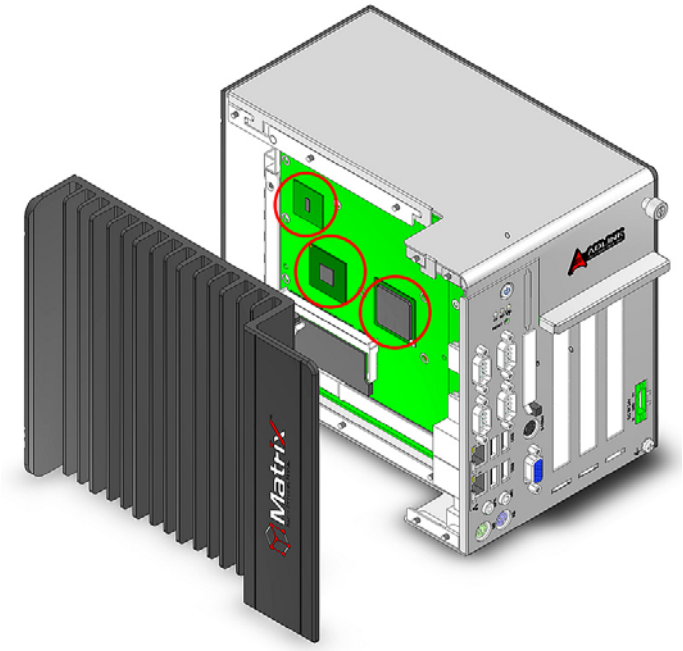
3. Once final assembly as shown is complete, mount the MXC-2012 controller on the wall via the screw holes.



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2.8 Cooling Considerations

Heat-generating components of the MXC-2012 (such as CPU and PCH) are all situated on the left side of the system. These components directly contact the heat sink via thermal pads for dissipation of generated heat. To maximize efficiency of heat dissipation, a minimum 2 inches (5 cm) clearance should be maintained adjacent to the heat sink.



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3 Driver Installation

After installing the operating system, you need to install all related drivers to make the system work accordingly. This section describes the drivers needed for Windows operating systems and the procedures to install them. For other OS support, please contact ADLINK for further information.

To install Windows drivers, please follow the steps below:

1. Properly install Windows before installing any drivers. Most of the standard I/O device drivers have been included in Windows
2. Install the chipset driver
3. Install the graphics driver
4. Install the Ethernet driver
5. Install the audio driver
6. Install the WDT (watchdog timer) driver

3.1 Installing the Chipset Driver

This section describes the procedure to install the chipset driver of MXC-2012. The chipset driver outlines to the operating system how to configure the Intel® 945GSE chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

One of the following operating systems must be fully installed and running on the system before installing this software:

- Microsoft Windows* Server 2003
- Microsoft Windows XP
- Microsoft Windows Vista

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Please follow the following steps to install the chipset driver for the MXC-2012:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXC-2000\Chipset\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. Reboot the system.

3.2 Installing the Graphics Driver

This section describes the procedure to install the graphics driver for the MXC-2012. The MXC-2012 is equipped with Intel® GMA950 graphics media accelerator integrated in Intel Mobile Intel® 945GSE chipset. The Intel® Graphics Media Accelerator Driver package supports Windows XP.

Please follow the following steps to install the graphics driver.

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXC-2000\Graphics\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. Reboot the system.

3.3 Installing the Ethernet Driver

This section describes the procedure to install the MXC-2012 Ethernet driver. The MXC-2012 provides two Gigabit Ethernet

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ports controlled by the Realtek RTL8111C GbE. Please follow the following steps to install the GbE driver for MXC-2012.

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXC-2000\LAN\
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.
4. Reboot the system.

3.4 Installing the Audio Driver

This section describes the procedure to install the audio driver of MXC-2012. The MXC-2012 supports Intel High Definition audio using Realtek ALC262 chip, which provides up to 24-bit, 192Kbps high quality audio input/output. Please follow the following steps to install audio driver for MXC-2012.

For Windows XP and Vista users:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXC-2000\Audio\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. Reboot the system.

3.5 Installing the WDT Driver

A WDT (watchdog timer) is a hardware mechanism to reset the system when the operating system or application is halted. A typical usage of WDT is to start the timers and periodically reset the timer, and when timer is expired, the system resets. API library and sample code are included with the WDT driver for programming reference.

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Please follow the following steps to install WDT driver for MXC-2012

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The WDT driver is located in the directory:
   x:\Driver Installation\Matrix\MXC-2000\WDT\
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.
4. Reboot the system.

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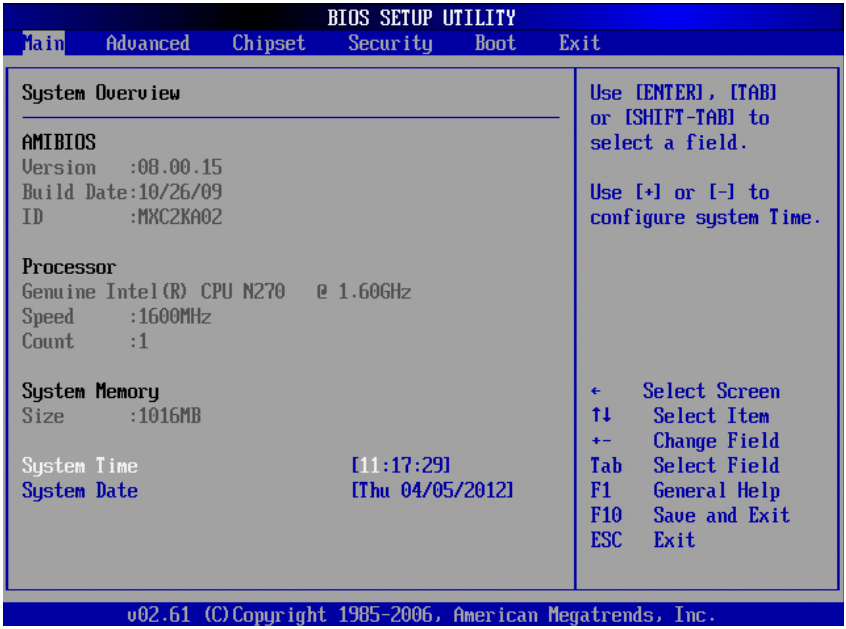
4 BIOS Setup

The Basic Input/Output System (BIOS) provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the MXC-2012. The BIOS setup program includes menus for configuring settings and enabling features of the MXC-2012. Most users do not need to use the BIOS setup program, as the MXC-2012 ships with default settings that work well for most configurations.

CAUTION:

Changing BIOS settings may lead to incorrect controller behavior and possibly inability to boot. In this case, reboot and restore the default settings. BIOS settings should not be changed unless there is no doubt as to the repercussions.

4.1 Main



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General system information is listed here. Please note that BIOS version, Processor, and system Memory Size are shown as examples only.

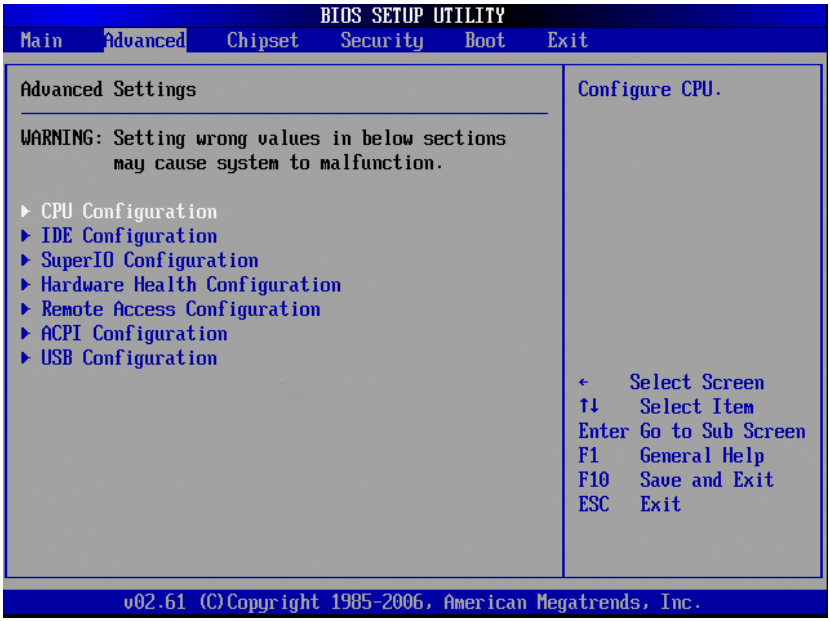
4.1.1 System Time/System Date

Use this option to specify the system time and date.

Highlight System Time or System Date using the up or down <Arrow> keys. Enter new values using the keyboard and press <Enter>. Use the < Tab > key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

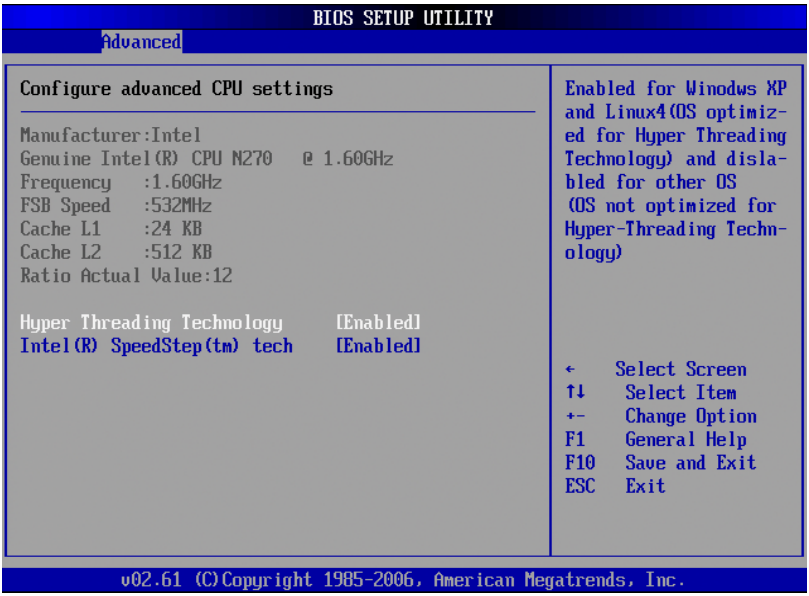
The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.46.

4.2 Advanced



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4.2.1 CPU Configuration



Hyper Threading Technology

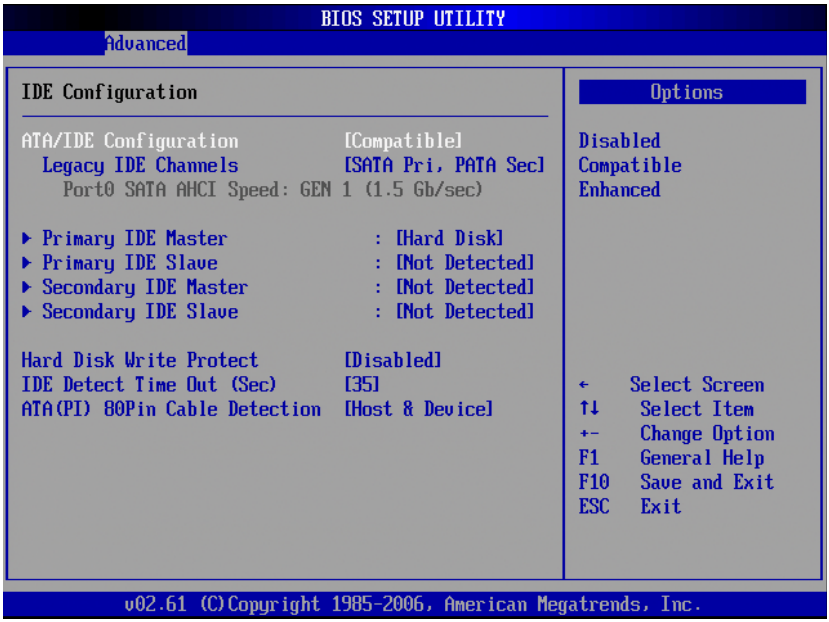
This option allows you to Enable/Disable hyper-threading Technology.

Intel® SpeedStep Tech

This option enables or disables Intel® SpeedStep technology.

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4.2.2 IDE Configuration



ATA/IDE Configuration

This option specifies whether the IDE channels should be initialized in Compatible Mode or Enhanced Mode. The settings are Disabled, Compatible and Enhanced. The default option is Compatible.

Legacy IDE Channels

When running in compatible mode, the SATA channel can be configured as a legacy IDE channel. The location of the IDE channel is selectable.

Primary IDE Master

Press < Enter > to configure the first device (master) on IDE interface.

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Primary IDE Slave

Press < Enter > to configure the second device (slave) on IDE interface.

Secondary IDE Master

Press < Enter > to configure the first device (master) on secondary IDE interface.

Secondary IDE Slave

Press < Enter > to configure the second device (slave) on secondary IDE interface.

Hard Disk Write Protect

Set this option as Enabled to prevent the hard disk drive from being overwritten.

IDE Detect Time Out

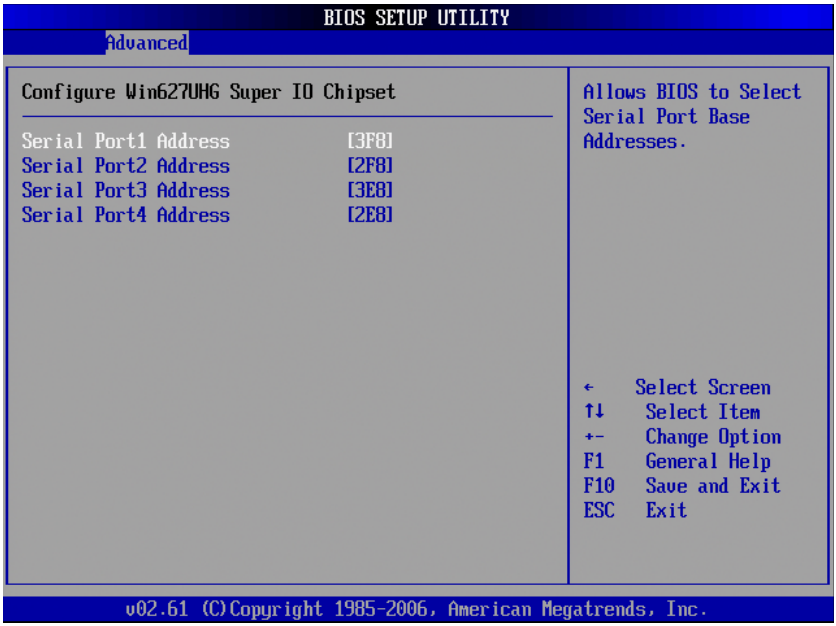
This option allows you to stop searching for IDE devices within the specified number of seconds.

ATA(PI) 80Pin Cable Detection

Selects the mechanism for detecting the type of IDE cable used.

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4.2.3 Super I/O Configuration



Serial Port1/ Port2/ Port3/ Port4 Address

These four options specify the base I/O port address of serial port1 to serial port4.

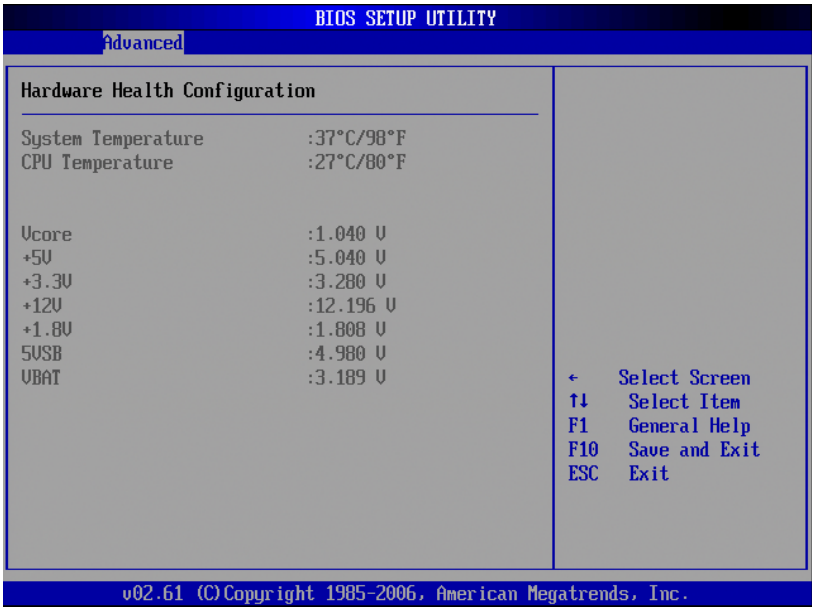
NOTE:

To avoid resource conflict do not set the same value for different serial ports.

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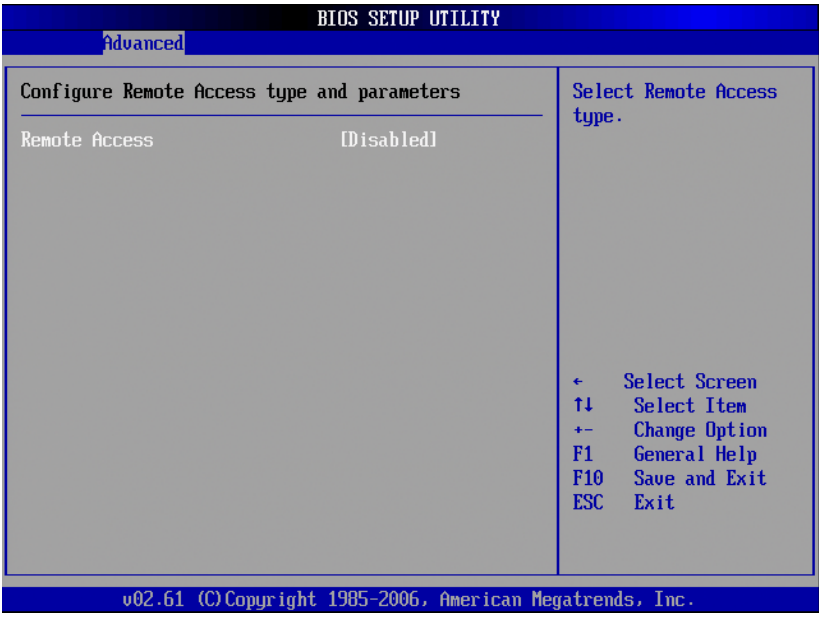
4.2.4 Hardware Health Configuration

Allows users to monitor hardware status including CPU temperature, system temperature, and system voltages (Vcore, +5V, +3.3V, +12V, +1.8V, 5VSB, VBAT).



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4.2.5 Remote Access Configuration



This option allows a remote access by another computer to get POST messages and send commands through serial port access.

Remote Access

Select this option to Enable or Disable the BIOS remote access feature.

NOTE: Enabling Remote Access requires a dedicated serial port connection, which, once disabled in Super I/O Configuration, cannot be used for remote access.

Serial Port Number

Specify the serial port you want to use for remote access. Available options are COM1, COM2, COM3 and COM4.

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If serial port settings in Advanced ⇒ SuperIO Configuration are changed, Save Changes must be selected, followed by Exit, and then the system rebooted, in order that the changes are reflected in Remote Access options.

Serial Port Mode

Specify the baud rate of the serial port for console redirection. Available options are 115200 8,n,1; 57600 8,n,1; 19200 8,n,1; and 9600 8,n,1.

Flow Control

Specify Flow Control mode for console redirection. Available options are None, Hardware, and Software.

Redirection after BIOS POST

This option allows you to set Redirection configuration after BIOS POST. Available options are Disabled, Boot Loader, and Always.

Terminal Type

This option is used to specify either VT100/VT-UTF8 or ANSI terminal type. Available values areANSI, VT100, or VT-UTF8.

VT-UTF8 Combo Key Support

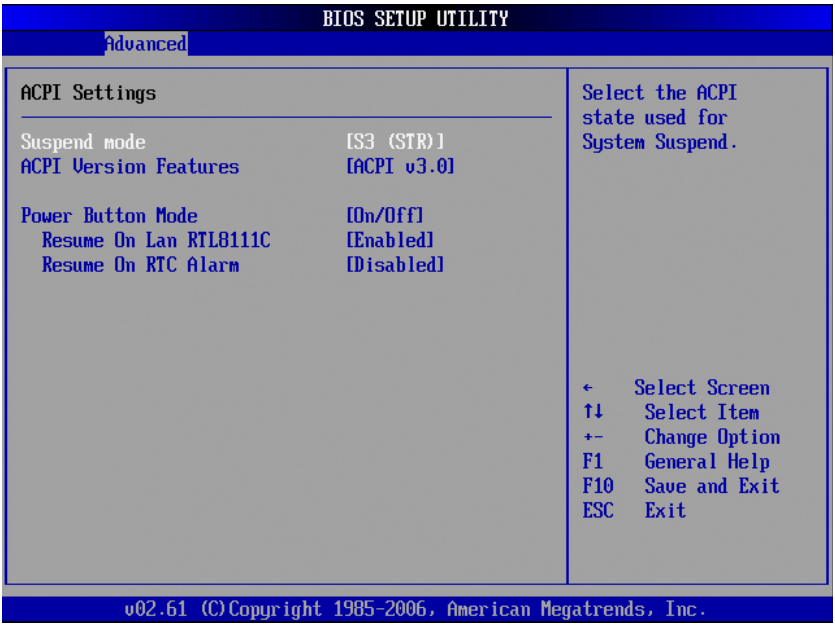
This option enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals. Available options are Enabled and Disabled.

Sredir Memory Display Delay

This option specifies the delay in seconds to display memory information. Available options are Delay, Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

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4.2.6 ACPI Configuration



Suspend Mode

This setting specifies either S1 (POS) or S3 (STR) system suspend mode. The Optimal and Fail-Safe Default setting is S3 (STR).

Power Button Mode

Specifies response when pressing the power button in DOS environment.

Resume On LAN RTL8111C

This option enables/disables RTL8111C LAN wake-up function. If enabled, a packet can be sent via Ethernet from a remote computer to turn on the MXC-2012.

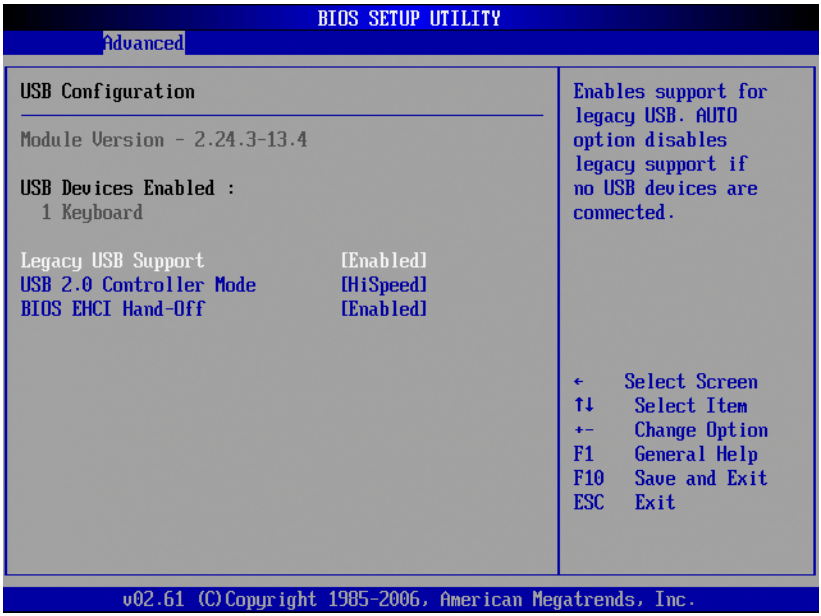
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Resume On RTC Alarm

This option enables/disables RTC (Real Time Clock) wake-up function. RTC wake-up function allows automatic power up of the MXC-2012 at a specific date/time.

4.2.7 USB Configuration

Detected USB devices are listed.



Legacy USB Support

Legacy USB Support also refers to USB mouse and keyboard support. Normally if this option is not enabled, attached USB mouse or keyboard will not be available until a USB compatible operating system fully boots up with USB drivers loaded. With this option enabled, attached USB mouse or keyboard is usable even when no USB drivers loaded.

USB 2.0 Controller Mode

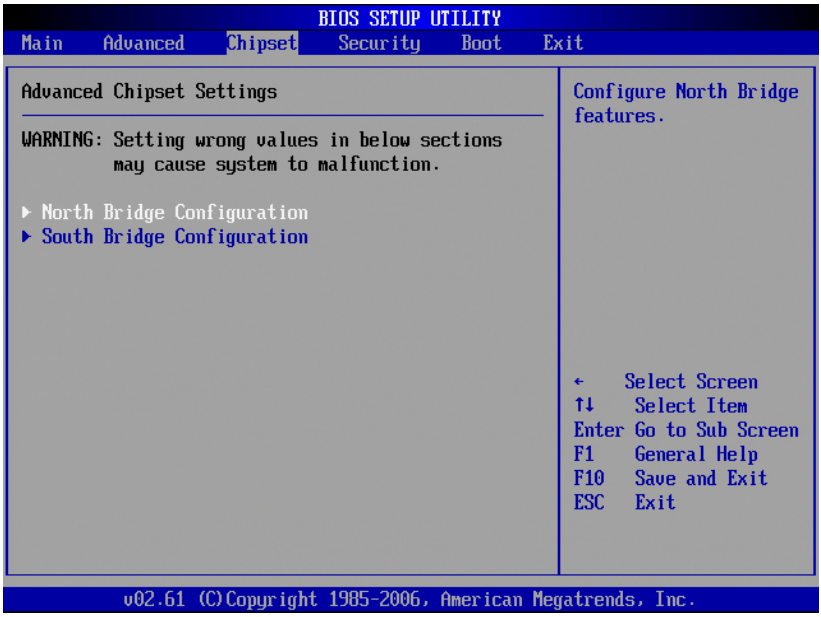
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The USB 2.0 Controller Mode configures the data rate of the USB port. Available options are FullSpeed (12 Mbps) and HiSpeed (480 Mbps).

BIOS EHCI hand-off

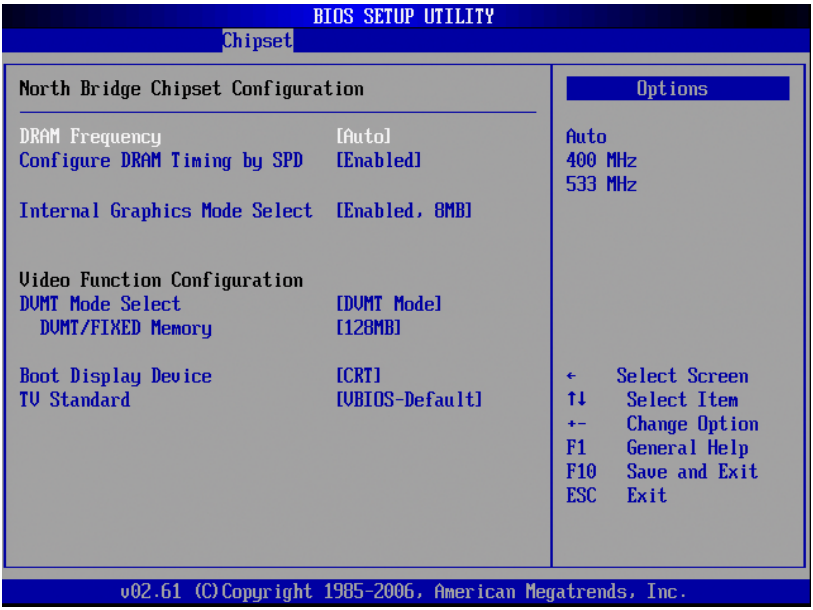
This option provides a workaround for OSes without ECHI hand-off support. The change of EHCI ownership should be claimed by the EHCI driver.

4.3 Chipset



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4.3.1 Northbridge Configuration



DRAM Frequency

Specify DRAM frequency. You can specify whether let BIOS set DRAM frequency automatically or configure it manually (400 MHz or 533 MHz).

Configure DRAM Timing by SPD

Specify Enable to allow the timing setting of DRAM to be configured from SPD or Disable to configure it manually.

Internal Graphics Mode Select

Specifies the size of system memory used by internal graphics device. 8MB is recommended.

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DVMT Mode Select

Dynamic Video Management Technology (DVMT) allows additional system memory to be dynamically allocated to the operating system for graphics usage. DVMT ensures a solid balance between system performance and graphics performance.

Options include:

Fixed Mode: The graphics driver reserves a fixed portion of the system memory as graphics memory

DVMT Mode: The graphics driver dynamically allocates system memory for graphics usage according to system and application demand

Combo Mode: The graphics driver reserves a fixed amount of memory as dedicated graphics memory, while dynamically allocating system memory in the operating system according to system and application demand

DVMT/FIXED Memory

Specifies memory size to be allocated for DVMT or FIXED mode

Boot Display Device

Specifies display device output when system boots or in DOS/ BIOS setup environment. CRT or TV output can be specified.

TV Standard

For S-video or composite output, the TV standard can be specified to match the TV signal output in different regions. Available options are NTSC, PAL and VBIOS-Default.

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4.3.2 Southbridge Configuration



USB Function

Specifies the number of USB ports enabled.Default value is 8.

USB 2.0 Controller

Enables or disables built-in USB 2.0 controller.

Audio Controller

Enables/Disables the Azalia HD audio or AC97 audio.

Restore on Power Loss

Determines system status when external power is restored after a power loss.

Options include:

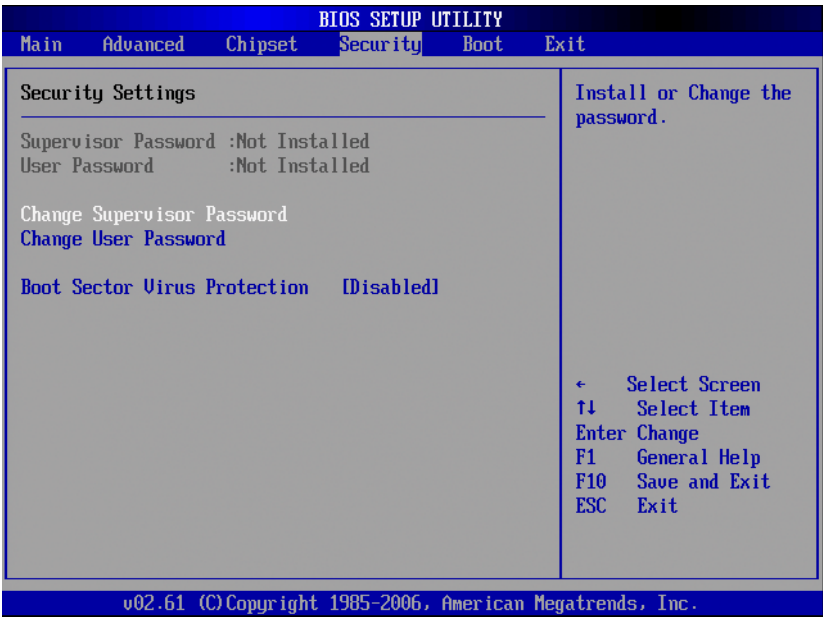
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Power Off:Remains off when external DC power is restored

Power On:Turns on when external DC power is restored.

Last State:Following power loss, resumes the previous on/off state when external power is restored

4.4 Security



The Security setup menu provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

To uninstall the passwords, a NULL password can be set.

4.4.1 Change Supervisor Password

Select Change Supervisor Password and press <Enter>. Enter your password when prompted. The password is stored in NVRAM after setup is complete.

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User Access Level

This option appears after specifying Supervisor password, and allows access level for users to be specified.

Options include:

No Access: Users are not permitted access to BIOS settings

View Only: Users are permitted to view BIOS settings but not enter changes

Limited: Users are permitted to change limited items in BIOS.

Full Access: Users are permitted to access and change all settings

Change User Password

After a new password is entered, it is stored in NVRAM after setup is complete.

Password Check

Appears after Supervisor password is set.

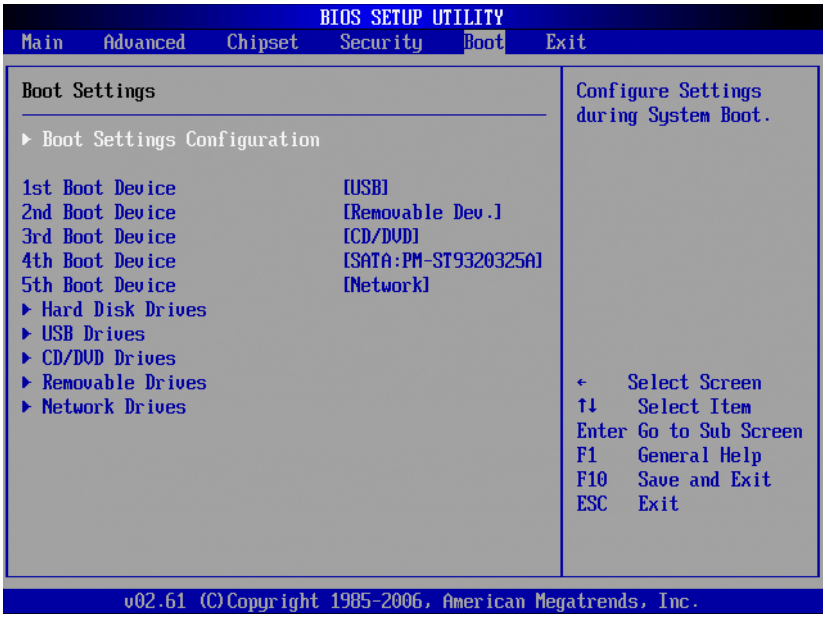
Options include:

Setup: Password is checked when BIOS setup is entered

Always: Password is checked when system boots

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4.5 Boot



4.5.1 Boot Settings Configuration

Quick Boot

Options inlcude:

Disabled: Directs BIOS to perform all POST tests

Enabled: Directs BIOS to skip certain POST tests to boot faster

Num-Lock

Specifies whether Number Lock is on or off after powering up.

RTL8111C PXE ROM

Disables/Enables RTL8111C PXE function.

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Boot Device Priority

Specifies the priority of devices based on which boot is performed. All installed boot devices are detected during POST and displayed on the screen. To specify different boot devices:

Booting from a SATA hard drive:

1. Select Hard Disk Drives and Enter; SATA hard drive is displayed with identification string
2. Specify as 1st Drive
3. Return to the upper level and select SATA hard drive as 1st Boot Device

Booting from CF card

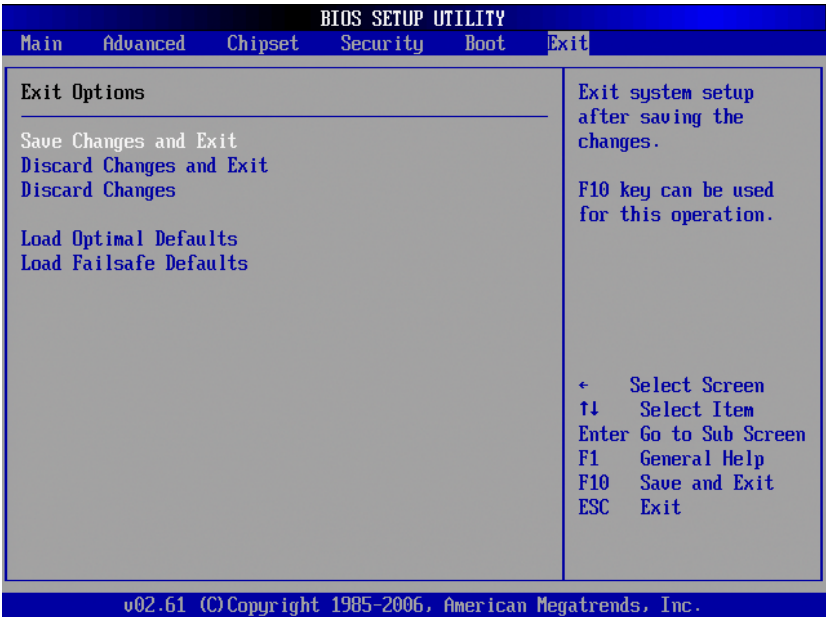
1. Select Hard Disk Drives and Enter; CF card is displayed with identification string
2. Specify as 1st Drive.
3. Return to the upper level and select CF card as 1st Boot Device

Booting from USB CD/DVD/Flash drive

1. Select USB Drives and Enter; USB device is displayed with identification string
2. Specify as 1st Drive
3. Return to the upper level and select CD/DVD drive as 1st Boot Device

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4.5.2 Exit



Save Changes and Exit

When BIOS settings are complete, selecting this option saves changes and reboots the system, after which the new settings take effect.

Discard Changes and Exit

Discards all changes and exits BIOS setup.

Discard Changes

Discards all changes without exiting BIOS setup.

Load Optimal Defaults

Sets all BIOS options to complete defaults designed for maximum system performance, but may not work best for all com-

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puter applications. Optimal Setup options should not be applied if system configuration problems accur.

Load Failsafe Defaults

Sets all BIOS options to complete defaults designed for maximum system stability, but not performance. Fail-Safe Setup options are indicated if system configuration problems occur.

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Appendix: WDT Function Reference

This appendix describes the usage of the watchdog timer (WDT) function library for the MXC-2012, a hardware mechanism to reset the system in case of operating system or application failure. After starting watchdog timer, periodic reset in the application is required before the timer expires. Once the watchdog timer expires, a hardware-generated signal is sent to reset the system.

To use the WDT function library for MXC-2012, you need to include the header file WDT.h and linkage library WDT.lib in your C++ project.

InitWDT

@ Description

Initialize the watchdog timer function of MXC-2012. InitWDT must be called before the invocation of any other WDT function.

@ Supported controllers

MXC-2012, MXC-2012, MXC-2012D, MXC-2012D

@ Syntax

C/C++

```
BOOL InitWDT()
```

@ Parameters

None

@ Return code

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer fails to initialize.

SetWDT

@ Description

Set the timeout value of watchdog timer. There are two parameters for this function to indicate the timeout ticks and unit.

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Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXC-2012, MXC-2012, MXC-2012D, MXC-2012D

@ Syntax

C/C++

```
BOOL SetWDT(BYTE tick, BYTE unit)
```

@ Parameters

`tick`

Specify the number of tick for watchdog timer. A valid value is 1 - 255.

`unit`

Specify the timeout ticks of the watchdog timer.

Value	Description
0	The unit of tick is second. For example, when you specify tick as 100 and unit as 0, the timeout value is 100 seconds.
1	The unit of tick is minute. For example, when you specify tick as 100 and unit as 1, the timeout value is 100 minutes.

@ Return codes

`TRUE` if timeout value of watchdog timer is successfully set.

`FALSE` if timeout value of watchdog timer fails to set.

StartWDT

@ Description

Start the watchdog timer function. Once the StartWDT is invoked, the countdown of watchdog timer starts. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXC-2012, MXC-2012, MXC-2012D, MXC-2012D

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@ Syntax

C/C++

```
BOOL StartWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer fails to start.

ResetWDT

@ Description

Reset the watchdog timer. The invocation of ResetWDT allows users to restore the watchdog timer to the initial timeout value specified in SetWDT function. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXC-2012, MXC-2012, MXC-2012D, MXC-2012D

@ Syntax

C/C++

```
BOOL ResetWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully reset.

FALSE if watchdog timer fails to reset.

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StopWDT

@ Description

Stop the watchdog timer.

@ Supported controllers

MXC-2012, MXC-2012, MXC-2012D, MXC-2012D

@ Syntax

C/C++

```
BOOL StopWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully stopped.

FALSE if watchdog timer fails to stop.

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

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